IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANTS' MAIN BRIEF ON APPEAL
(SECOND)

APPELLANT(S):	Dirk Daecke, et al.	DOCKET NO:	P00,1843-01
SERIAL NO.:	09/697,262	ART UNIT:	2668
FILED:	October 26, 2000	EXAMINER:	Elallam, Ahmed
CONF. NO.:	3837		

TITLE: CIRCUIT ARRANGEMENT AND METHOD FOR DATA TRANSMISSION

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. §41.37, Appellant submits this Brief in support of the appeal of the above-referenced application in support of the patentability of claims 1-14, 16, 22, and 23 finally rejected in the Office Action, dated September 11, 2006. A copy of the claims on appeal is attached as Appendix A.

A Notice of Appeal was filed on December 7, 2006, and a Pre-Appeal Brief Request for Review was filed on December 8, 2006. A Notice of Panel Decision from Pre-Appeal Brief Review was mailed January 19, 2007, maintaining the rejection and indicating that the application should proceed to the Board of Patent Appeals and Interferences.

This Appeal is being submitted subsequently to a previous appeal in which an Appeal Brief was filed on May 23, 2006. The response to this prior appeal was the reopening of prosecution with a Final Office Action, citing the same art for certain claims, and new art for other claims. Appellants apply the previously submitted Appeal Brief fee of $500 to the present Appeal Brief and understand

that no further fee is due. In the event that a further fee is determined to be due, Appellants herewith authorize that it be deducted from deposit account no. 50 1519.

REAL PARTY IN INTEREST

The real parties in interest in this appeal are the assignees, Siemens Aktiengesellschaft (50%), and Infineon Technologies AG (50%), both German corporations, by virtue of the Assignments recorded February 12, 2001 at reel/frame 011516 / 0258, and June 22, 2001 at reel/frame 011927 / 0106.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and no related interferences known to Appellant, Appellants' Assignee, or Appellants' legal representative.

STATUS OF CLAIMS

Claims 1–14, 16, 22 and 23 are on appeal, and constitute all pending claims of the application. These claims were all rejected in the Final Office Action. The status of the claims is as follows:

Claims / Section	35 U.S.C. Sec.	References / Notes
1–11 & 16	§102(e) Anticipation	• Bartholomew, et al. (U.S. Patent No. 6,400,708).
12–14, 22, & 23	§103(a) Obviousness	• Bartholomew, et al. (U.S. Patent No. 6,400,708); and • Chaplik, et al. (U.S. Patent Publication No. 2004/0146068).

STATUS OF AMENDMENTS

Amendment C was filed September 30, 2005, in response to the non-final Office Action dated June 30, 2005. The claim amendments of Amendment C were entered and served as the basis for the Final Office Action. No further amendments to the claims have been made. A copy of these claims is provided in Appendix A.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The use of page and line numbers and reference characters in the

drawings is provided by way of example and for purposes of clarity, but is in no way intended to limit the claimed subject matter unless expressly indicated.

The present invention, in a general sense, is directed to a system and appertaining method synchronous transmission of voice and data over a common frame, e.g. SDSL, where all payload services (e.g. ISDN, voice, data) and the transport mechanism share the same overhead infrastructure (synchronization and signalling channel). Specification page / lines 2/4-29.

Independent claims 1-3 are apparatus claims. Claim 1 is directed to a transmission unit and claim 2 is directed to a reception unit. Claim 3 combines the transmission unit and reception unit of the first two claims. Independent claims 4 and 16 are method claims that describe the inventive process.

Accordingly, claim 1 describes a circuit arrangement, comprising: a transmission unit (LT, Figure 3; also NT, for 2-way communication) for inserting data (e.g., ISDN B-channels, Figure 6, and 5/12-20; 6/1-10) belonging to at least two terminal equipment types or services that are capable of including both voice and data (e.g., ISDN equipment/service) (4/27 – 5/2) in a common frame (e.g. SDSL frame, Figure 4, Figure 6) having a frame length (Figure 4, summation of bit field lengths), said transmission unit (LT) comprising an insertion mechanism (SDSLM, Figure 3) for inserting said data of the at least two terminal equipment types (B1-B4, Figure 6) said data of all terminal equipment types being synchronously inserted into said common frame (e.g., ISDN B-channels into SDSL frame, payload block PO1, Figure 6) with a common channel for operational control (OH, Figure 6) and transmitted with a digital time-division multiplex technique (SDSL).

Claim 2 describes a circuit arrangement, comprising: a reception unit (NT, Figure 3; also LT, for 2-way communication) for dividing a datastream (SDSL-transmission path, Figure 5) transmitted in a frame (SDSL Frame, Figure 4, Figure 6), said frame comprising data (B1-B4, Figure 6) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20, Figure 6, 6/1-10), by a transmitter (SDSLM, Figures 3, 5) to at least one terminal

equipment type (E21) of said at least two terminal equipment types (E21, E22, 2/10-14); and a switch module (S, Figure 5, 5/26-27) for a purpose-conforming division of said datastream transmitted in said frame (5/27-30), in which a further division onto further terminal equipment of said at least two terminal equipment types or services is undertaken based on control data (Figure 5, 5/27-30).

Claim 3 is simply a combination of the transmission and reception units of claims 1 and 2).

Claim 4 is directed to a method for transmitting a data stream (SDSL-transmission path, Figure 5) in a common frame (SDSL Frame, Figure 4, Figure 6) with a common channel for operational control (OH, Figure 4, 5/21-23) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20), comprising the steps of: synchronously inserting data of said at least two terminal equipment types or services (e.g., ISDN B-channels, B1-B4 Figure 6, and 5/12-20; 6/1-10) into said common frame (SDSL, Figure 4, Figure 6) in a first unit (LT); transmitting said data to a second unit (NT) with a time-division multiplex method (SDSL); and dividing said data stream (SDSL-transmission path, Figure 5) in said common frame (SDSL, Figure 4, Figure 6) to terminal devices of at least two terminal equipment types or services in said second unit (E21, E22, Figure 5).

Claim 5 is directed to a method according to claim 4, further comprising the step of depositing data for operational control (eoc in OH, Figure 4) of connections to which at least two terminal equipment types or services (E21, E22, Figure 5) that is capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20) are connected in a single operating eoc channel (OH, Figure 4, 5/21-23) of said frame (SDSL Frame, Figure 4, Figure 6).

Claim 9 is directed to a method according to claim 4, further comprising the steps of: providing bits for operational control (eoc, Figure 4) in said data (PL1, PL2, Figure 4) belonging to said terminal equipment types or services (E21, E22, Figure 5); and arranging said bits (eoc, Figure 4) outside of a payload data region (P01–POn, Figure 4) provided for said terminal types or services.

Claim 10 is directed to a method according to claim 9, wherein said bits (eoc) for operational control are arranged in an overhead (OH) of said frame.

Claim 11 is directed to a method according to claim 10, further comprising the steps of: allocating said bits for operational control (eoc) to an operating eoc channel; and addressing said bits for operational control via a sub-address in a message format of said operating channel (Figure 7 ; 3/8-10; 6/11-16).

Claim 12 is directed to a method according to claim 4, further comprising the step of accepting data of a plurality of ISDN connections in said frame, said frame being asymmetric digital subscriber line frame (2/22–24; 6/17–24)

Claim 13 is directed to a method according to claim 4, further comprising the step of accepting data of a plurality of traditional telephony connections in said frame, said frame being a symmetric digital subscriber line frame (3/1–2).

Claim 14 is directed to a method according to claim 4, wherein said step of transmitting said data comprises transmitting said data of a symmetric digital subscriber line frame SDSL synchronously on a transmission link between said first unit (LT), which is a network node, and said second unit(NT), which is a network termination unit with a time-division multiplex method (Figure 3, 4/12–18).

Claim 16 is directed to a method for transmitting a data stream (SDSL-transmission path, Figure 5) in a common frame (SDSL Frame, Figure 4, Figure 6) with a common channel for operational control (OH, Figure 4, 5/21-23) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20), comprising the steps of: synchronously inserting data of said at least two terminal equipment types or services (e.g., ISDN B-channels, B1-B4 Figure 6, and 5/12-20; 6/1-10) into said common frame (SDSL, Figure 4, Figure 6) in a first unit (LT); synchronously transmitting said data to a second unit (NT) with a time-division multiplex method (SDSL); and dividing said data stream (SDSL-transmission path, Figure 5) of said common frame (SDSL, Figure 4,

Figure 6) to terminal devices of at least two terminal equipment types or services in said second unit (E21, E22, Figure 5).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues on appeal are as follows:

1. Whether the subject matter of claims 1–11 and 16 are anticipated under 35 U.S.C. §102 by U.S. Patent No. 6,400,708 (Bartholomew);

2. Whether the subject matter of claims 12–14, 22, and 23 is obvious under 35 U.S.C. §103 by the combination of Bartholomew and U.S. Patent Publication No. 2004/0146068 (Chaplik).

ARGUMENTS

EXAMINER'S POSITION

ARGUMENT 1–Anticipation of the independent claims by Bartholomew

Examiner's Position: Bartholomew anticipates claims 1–11 and 16 of the present invention because all of the elements of the claims are taught by this reference.

In the OA, on pp. 3–4, under numbered paragraph 2, the Examiner stated:

> Regarding claim 1, with reference to figures 1-3, Bartholomew discloses a circuit arrangement (Fig. 2) comprising: [sic]
>
> Bartholomew further discloses with reference to figures 1-3, a circuit arrangement (Fig. 2) comprising the channel bank 31, the channel bank comprising Multiplexer/Demultiplexer 75, see figure 2, (claimed transmission unit for inserting data) for inserting voice from telephone 29 (claimed equipment for voice) and data from computer 25 (claimed equipment for data) to be carried over the synchronous **T1 Frame**, data from the two B channels are mapped into respective two DS0 of the **T1 frame**, and the combined D and EOC (embedded operations control) into another DS0 channel. The voice and data are transmitted using TDM (Time division Multiplexing). see [sic] column 1, lines 39-49, and column 9, lines 3-20, see column 11, lines 63-67, column 12, lines 1-19, lines 60-67 and column 13, lines 1-31 , [sic] Therefore, the T1 frame reads on the claimed **common frame having a frame**

> **length**, inputting data and voice into the timeslots (DS0) of the T1 frame reads on the claimed **inserting data belonging to at least two terminal equipment types or services that are capable of including both voice and data in a common frame having a frame length**, data and voice been inserted in synchronous T1 frame reads on the claimed **insertion mechanism for inserting said data of the at least two terminal equipment types, said data of all terminal equipment types being synchronously inserted into said common frame.** The combined D and EOC into a different DS0 reads on the claimed common control channel for operational control. [emphasis in original]

The Examiner addressed claim 2 by stating:

> Regarding claim 2, with reference to figures 1–3, Bartholomew discloses a circuit arrangement (Fig. 2) comprising:
>
> channel bank 31 for dividing a data stream transmitted in a T1 frame by a multiplexer/dumilteplexer [sic] 75 (Fig. 2) to a terminal equipments [sic] (telephone 29 and Computer 25), (claimed a reception unit for dividing a data stream transmitted in a frame, the frame comprising data belonging to at least two terminal equipment types or services that are capable of including both voice and data, by a transmitter to at least one terminal equipment of the at least two equipment types), (the transmitter is inherent to Bartholomew because it is required for transmitting voice and data to the telephone 29 and computer 25), the Multiplexer/Demultiplexer 75 (the Multiplexer/Demultiplexer also corresponds [sic] claimed switch module because it provides the same functionality of the claimed switch module) for demultiplexing the data stream received to its destined terminal equipment (29, 25), wherein EOC (embedded operations channel) is used for control (claimed control data) carried over a DS0, the DS carrying the EOC is different than the DS0(s) allocated for data) [sic], wherein the EOC is embedded in a DS0 of the T1 frame; see column 9, lines 3–20, column 11, lines 63–67; column 12, lines 1–19, lines 60–67 and column 13, lines 1–31. (Claimed a switch module for a purpose-conforming division of data stream transmitted in the frame, its which a further division onto further terminal

equipment types or services is undertaken based on control data).

The Examiner addressed independent claims 3, 4, and 16 by stating:

> Regarding claim 3, Bartholomew discloses a circuit arrangement (Fig. 2) comprising a transmission reception as indicated in claim 1 and reception unit as indicated in claim 2.
>
> Regarding claims 4 and 16, with reference to, figures 1–3, Bartholomew discloses a method in a circuit arrangement (Fig. 2) for ("synchronously" as in claim 16) transmitting a data stream in a common frame belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising:
>
> channel bank 31 (claimed first unit) for inserting data belonging to terminal equipment 29 and 25, the channel bank comprising a Multiplexer/Demultiplexer 75 for inserting data of the terminal equipments (telephone 29 and computer 25) into respective DS0 slots, DS0 slots for transport over a T1 frame (T1 frame is a synchronous frame) to a channel bank 39, (claimed second unit) see column 12, lines 60–67 and column 13, lines 1–31, Bartholomew further discloses concurrent ISDN voice and data being mapped into respective DS0 slots, see column 1, lines 39-49, and column 9, lines 3-20, wherein EOC (embedded operations channel) which is used for control (claimed common channel for operational control) is carried over a DS0 other than the DS0 for data, (T1 frame is a TDM frame as indicated by its nature of carrying multiplexed time slots); see column 11, lines 63–67; column 12, lines 1–19, lines 60–67 and column 13, lines 1–31. Bartholomew shows another channel bank (35 as in figure 1, and 39 as in figure 2) (claimed second unit) connected [sic] the first channel bank over the T1 line, see figure 1. (Claimed synchronously inserting data of at least two terminal equipment types or services into the frame in a first unit, and transmitting the data to a second unit with a time-division multiplex method);
>
> wherein the channel bank 39 (second unit) has a Multiplexer/demultiplexer 81 for dividing data stream (T1) to terminal devices of terminal equipments 3, 7 (Figure 1). (Claimed dividing data stream in said common frame to terminal devices of at least one

terminal equipment type in the second unit).

ARGUMENT 2–Anticipation of claims 5 and 6 by Bartholomew

Examiner's Position: Bartholomew anticipates claims 5 and 6 of the present invention because all of the elements of the claims are taught by this reference.

In the OA, on p. 6, the Examiner indicated that Bartholomew anticipated the elements of claims 5 and 6. Specifically, the Examiner stated:

> Regarding claim 5 and 6, Bartholomew discloses using ISDN (Integrated Services Digital Network) in which combined D, and EOC (embedded operations channel) channel are translated into a DS0 slot of the synchronous T1 frame, the 2B and D channels corresponding to one subscriber's ISDN service (2B +D channels), See column 9, lines 3-20, column 10, lines 48-56, column 14, lines 16-31, column 15, lines 59-67 and column 16, lines 1–12. (Examiner interpreted the eoc for control of both the 2B channel and part of D channel as being the claimed depositing data for operational control of connections to which at leash two terminal equipment types or services that are capable of including both voice and data are connected in a single operating eoc channel of the frame as in claim 5 and connections are ISDN connections as in claim 6).

ARGUMENT 3–Anticipation of claims 9 and 10 by Bartholomew

Examiner's Position: Bartholomew anticipates claims 9 and 10 of the present invention because all of the elements of the claims are taught by this reference.

The Examiner addressed claims 9 and 10 of the present invention on p. 7 of the OA as follows.

> Regarding claim 9, as discussed above with refrence [sic] to claim 4, Bartholomew disclose the frame being a T1 frame that comprises 24 DS0 slots, part of the DS0 comprises EOC bits for operational control, while two other DS0 comprises data only. (Examiner interpreted the two B channel [sic] comprising data only as the claimed payload data region, and the part of the DS0 having the EOC as the claimed arranging

> bits for operational control). (Claimed providing bits for operational control in the data belonging to the terminal equipment types, and arranging the bits outside of [sic] payload data region provided for the terminal types).
>
> Regarding claim 10, Bartholomew discloses having part of the DS0 comprises EOC bits for operational control for respective two B channels. (Examiner interpreted the part of the DS0 comprising EOC bits as the claimed bits for operational control are arranged in an overhead of the frame).

ARGUMENT 4–Anticipation of claim 11 by Bartholomew

Examiner's Position: Bartholomew anticipates claim 11 of the present invention because all of the elements of the claims are taught by this reference.

In the OA, on p. 7, the Examiner stated:

> Regarding claim 11, Bartholomew discloses part of the DS0 comprises EOC bits for operational control for respective two B channels, having the part of the DS0 for OEC bits for both two B channel [sic] is interpreted as the claimed addressing said bits for operational control via a sub-address in a message format of the operating channel, because some bits of the OEC are one for one B channel of the two B Channel [sic] while the other bits of the EOC are related to the other B channel of the two B channel [sic]).

ARGUMENT 5–Obviousness of claims 12–14, 22, and 23 by Bartholomew in view of Chaplik

Examiner's Position: Chaplik teaches that SDSL is used mainly as a replacement of T1 network connections, and therefore it would have been obvious to replace the T1 of Bartholomew with the SDSL as indicated by Chaplik because Chaplic is cost effective.

In the OA, on pp. 8-9, the Examiner noted that claims 12–14, 22, and 23 all required the presence of an SDSL frame, and that Bartholomew failed to teach an SDSL frame. The Examiner then combined Bartholomew with Chaplik because:

> Chaplic [sic] discloses that SDSL is used mainly as a

> replacement of T1 network connections. See Chaplic paragraph [0005].
>
> Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to replace the T1 of Bartholomew with the SDSL as indicated by Chaplic because the SDSL is cost effective. It is also advantageous to use SDSL because it requires only one copper wire-pair instead of two copper wire-pairs as required for the T1 services, the benefit would be the ability to implement SDSL using both wire-pairs resulting in increase of bandwidth capacity in Bartholomew.

APPELLANTS' POSITION

ARGUMENT 1–Anticipation of the independent claims by Bartholomew

Appellants' Position: Bartholomew does not anticipate claims 1–11 and 16 of the present invention because all of the elements of the claims are not taught by this reference—namely, Bartholomew does not teach or suggest the synchronous insertion and transmission required by the independent claims.

The present invention introduces a new method for synchronous transmission of voice and data over a common frame, e.g., SDSL, where all payload services (e.g., ISDN, voice and data) and the transport mechanism share the same overhead infrastructure (i.e., synchronization and signalling channel), which is distinguished over the prior art cited by the Examiner, which uses a separate channel inside of the payload region.

Bartholomew's patent does not teach or suggest the synchronous insertion and transmission required by the independent claims.

The independent claims of the present invention require that the data of all terminal equipment types are synchronously inserted into a common frame and transmitted with a digital time-division multiplex technique. Bartholomew does not teach or suggest synchronization of the payload (the D-Channel voice and the B-channels) and of the transport mechanism (the ISDN frames on link 11 or the T1 link 33). This is because Bartholomew describes a new method for delivering new services, but leaves the transport mechanisms unchanged.

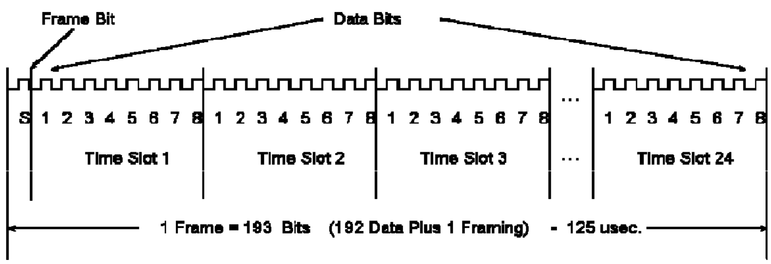
The Examiner refers to Bartholomew's "synchronous T1 frame" (see OA 3/8–10 (page 3, lines 8–10) and 5/11–13:

> [.......] for inserting voice from telephone 29 (claimed equipment for voice) and data from computer 25 (claimed equipment for data) to be carried over the synchronous T1 frame, [....]
>
> [....] for inserting data of the terminal equipments (telephone 29 and computer 25) into respective DS0 slots, the DS0 slots for transport over a T1 frame (T1 frame is a synchronous frame) to a channel bank [....]

However, the Examiner has failed to show how Bartholomew teaches the synchronous insertion and transmission of the data with a common channel for operational control. The Examiner indicates that the T1 frame is a *synchronous frame*, but he does not show that the payload, the D-channel voice and the data, is synchronous to the T1-frame.

For clarification, T1 is defined as a two-point, dedicated, digital service provided on terrestrial digital facilities capable of transmitting 1.544 Mb/s. A T1 frame is an application frame, in contrast to the frame of a data transmission mechanism, e.g., the ISDN frame.

The T1 frame (DS1 is the data carried on a T1 circuit) comprises 24 timeslots * 8 bits + 1 Synchronization bit = 192 bits + 1 bit = 193 bits. The first bit of each frame is used for synchronization. An illustration of a T1 frame is shown below. The length of a T1 frame is 125 µs. Therefore the T1 line rate is 1544 kbits/s = 193 bits / 125 µs = 24 x 64 kbits/s + 8 kbits/s. These are 24 x DS0s (64 kbits/s) and the 8 kbits/s F-bits which form a bit pattern for synchronization.



However, the mere fact that the T1 frame contains synchronization bits is

insufficient for teaching a "synchronous frame" or that a synchronous insertion and transmission is performed. Bartholomew does not provide any disclosure as to whether these synchronization bits are also the timing reference of the compressed voice channel or the data transmitted over the B-channels.

Of significant importance, it cannot be assumed that in Bartholomew, the clocks of the D- and B- channels from the ISDN link (12) are aligned with he clocks of the T1 link (33). In fact, the T1 clock loses synchronization if more than 15 consecutive zeros occur in the transmitted data. Therefore, pulse stuffing is used by setting every eighth bit to 1. But in this way, the payload and the T1 link obtain different clock rates and are not synchronous.

In order to compensate for clocking differences of the near-end and the far-end side, a T1 link can repeat or delete frames to compensate for these clocking differences. But this refers to the synchronization of the T1 link. The payload itself then needs a different synchronization reference.

In the OA, on page 5, lines 4-8, the Examiner wrote:

> Regarding claims 4 and 16, with reference to figures 1-3, Bartholomew discloses a method in a circuit arrangement for ("synchronously" as in claim 16) transmitting a data stream in a common frame belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising:

Figures 1-3 in Bartholomew do give not any indication about the synchronization of the system. One of ordinary skill in the art would recognize that the term "synchronous insertion and transmission" does not mean that data and voice services are transmitted simultaneously over the DSL link; the term *synchronous insertion and transmission* describes one process which means that the data and the frame have one common (synchronous) timing reference. This can be achieved by locking these processes to the same network clock.

The synchronization of payload services and the frame clock represents a special case, because typically the payload clock is not synchronized to the network clock. "Synchronously" as it is used in claim 16 means that the data and

the frame have the same timing reference, as would be understood by one of ordinary skill in the art.

It is clear, by reviewing, e.g., Figures 4 and 6 of the present invention that there is an insertion of the data (e.g., B1, B2, Z1, Z2, and operation and control data in OH) in the data that is intended to be transmitted synchronously. Here, the wording used clearly means "synchronous insertion into the frame and (synchronous) transmission".

Merriam Webster's 11th Collegiate Dictionary (computer-version, 2003) defines the term "synchronous" (when referring to digital communication as:

> 5 : of, used in, or being digital communication (as between computers) in which a common timing signal is established that dictates when individual bits can be transmitted and which allows for very high rates of data transfer

Furthermore, E.A. Lee and D.G. Messerschmitt's "Digital Communications" (Kluwer, p. 700) specifies "synchronous" more precisely as a "common time base at physically separated points".

As claimed, the term "synchronous" is used in accordance with its plain and ordinary meaning, as provided, e.g., by the dictionary definitions noted above. In other words, the term "synchronous" means that the transmitted payload data and the frame have a common timing reference.

The synchronization of the payload services and the frame clock represents a special case, because typically the payload clock is not synchronized to the network clock. Although the Examiner argued that the voice and data services in Bartholomew's invention are synchronized to the clock of the ISDN frame, Bartholomew does not provide any teaching or suggestion related to such synchronization issues.

The HDSL link as disclosed in Bartholomew is asynchronous (plesiochronous) whereas the inventive link is synchronous, and by way of example only for the broad claims, an exemplary synchronous SDSL link has been explained. There is a significant difference between Bartholomew's

asynchronous (plesiochronous) link and the inventive synchronous link. The synchronization takes place with the assistance of a common (e.g., an SDSL) clock. In this way the termination equipment at both ends is in sync and, for example, the ISDN clock which becomes identical to the SDSL clock, is available. Again, the broadest claims and arguments are not limited to an SDSL implementation... these are only discussed by way of example, and the same arguments apply to any non SDSL implementation that makes use of such a synchronous link.

For example, in the method specified in the HDSL standard, the synchronization signal is transmitted inside the payload. Bartholomew transmits voice-channel specific synchronization signal inside the payload, as disclosed at 9/17-20, "The switch communicates with various ISDN devices in the line using the EOC channel, for synchronization, maintenance and testing purposes."

Again, it is important to note that the application does not claim to invent the concurrent transmission of voice and data over a DSL link—in fact, this concept (very similar to that of Bartholomew's patent) where data and voice services are transmitted over one DSL link was acknowledged as prior art. See the Specification at 1/23-30 and Figure 2 of the application, where ISDN and broadband data transmitted in an HDSL frame.

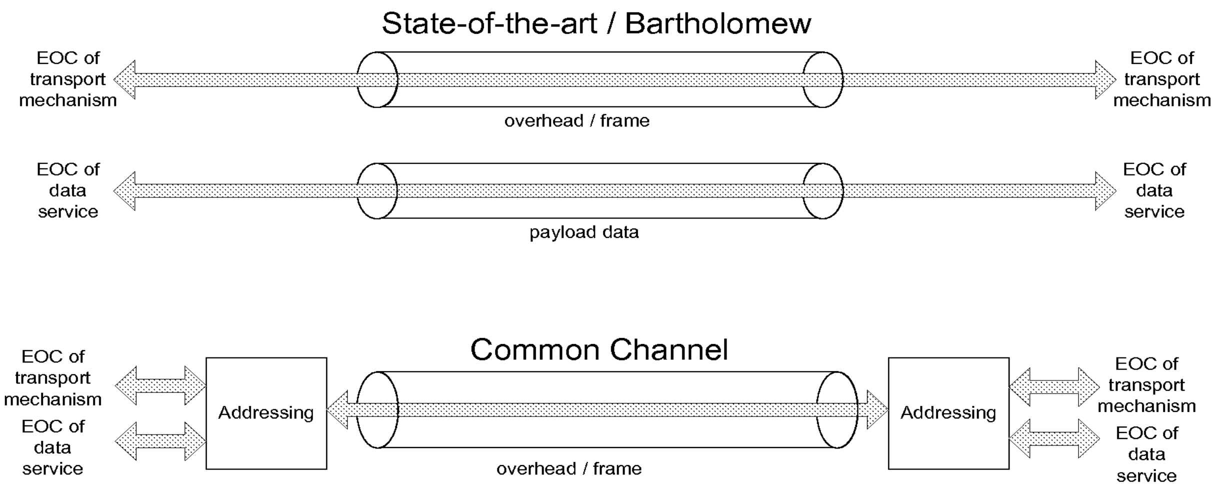
For these reasons, Bartholomew fails to teach or suggest the synchronous insertion and transmission as claimed in claims 1–11 and 16.

ARGUMENT 2–Anticipation of claims 5 and 6 by Bartholomew

Appellants' Position: Bartholomew anticipates claims 5 and 6 of the present invention because Bartholomew does not teach or suggest depositing data for operational control of connections in a single operating EOC channel of a frame, as required by claim 5.

Claim 5 focuses on the new notion of a common channel for operational control. A channel for operational control can be, e.g., an embedded operations channel (EOC) that supports operations communications between the network and the remote terminal. Now, the EOC of a data service, e.g. ISDN, can be combined with the EOC of the transport mechanism, e.g., SDSL. This common

channel for operational control is transmitted in the overhead of the frame. The following diagram illustrates the state-of-the-art disclosed by Bartholomew and the distinction by the claimed invention.



Although the Examiner assumes that the common channel for operational control, as claimed in claims 5 and 6, had already been anticipated by Bartholomew, Bartholomew, in fact, teaches the known state of the art, i.e., a method of mapping the ISDN B-channels, the D-channel and the ISDN EOC into DS0s. The following comparison of the present invention and the disclosure of Bartholomew's concept shows the fundamental differences of the signalling concept.

Bartholomew uses the ISDN transport mechanism in a different way than the traditional ISDN. Bartholomew uses the ISDN frame format to transmit 64 kbits/s data service (B-channels) and 16 kbits/s compressed voice data (D-channels). However, the payload in Bartholomew's system is not ISDN. In the abstract of his patent, lines 15-18, Bartholomew writes:

> The invention uses two or more B-channels on the DSL circuit for data communications and transports voice telephone communications on the low speed signaling D-channel.

In Bartholomew's patent a voice service is transported at the position of the ISDN D-channel while an unspecified data service is transported at the

position of the ISDN B-channels. Since the ISDN eoc belongs to the ISDN data transmission mechanism of the B-channels and the D-channels, one could assume, that the EOC transmits control information of the voice and data services. However, this is wrong: The ISDN EOC only contains messages that relate to the ISDN transport mechanism, but not to the channels or the data that is transmitted over these channels. The ISDN EOC, as specified in the ISDN standard ETSI TS 102 080, does not contain messages that refer to the D-channel only.

The D-channel voice does not use or share the ISDN EOC for signalling purposes. Instead, it has its own separate signalling channel inside the 16 kbits/s D-channel. This can be shown in Bartholomew's patent in the abstract, lines 20-23:

> The voice communications on the D-channel utilize in-band call set-up signaling and appropriate CODECs for digital communications compressed to the low D-channel rate.

In the OA, on page 4, lines 1-2 the Examiner writes:

> The combined D and EOC into a different DS0 reads on the claimed common channel for operational control.

However, this assumption is incorrect: The DS0 that transports the EOC and the D channel is not a common channel for operational control. The EOC carries operational control information, while the D channel carries compressed voice in Bartholomew's patent. Thus, voice data and control messaging are different kinds of data which cannot be combined in the common channel. Furthermore, a regular ISDN D-channel cannot be combined with the EOC channel, because the D-channel refers to the higher layers while the EOC refers to the transport mechanism.

A T1 frame comprises its own signalling channel inside the frame. The function of this signalling channel of the transport mechanism is comparable to the EOC of the SDSL frame (transport mechanism). It should be noted, that in Bartholomew's patent, this T1 signalling channel is kept separate and

unchanged. Thus Bartholomew's patent shows that there is no common channel for operational control.

Bartholomew states, at column 9 lines 3–20:

> Of particular note, the switched ISDN service involves all of the channels carried on an ISDN line. The channels include the two B-channels, the D-channel and an embedded operations channel (EOC). The two B-channels translate into two DS0 channels for transport over the T1 link. The EOC and D channels are combined on another DS0 within the T1 link 33. At the upstream channel bank 35, the B, D and EOC channels for one customer are communicated to and from the switch 37 over a BRI type ISDN line, so that the line 11.sub.2 appears as a pass-through all the way from the premises 1.sub.2 to the switch 37. The switch communicates with the customer premises equipment over the D-channel, for call set-up and tear-down signaling and the like. The switch provides selective connections for the B-channels, for call transport of digital voice and data services. The switch communicates with various ISDN devices in the line, using the EOC channel, for synchronization, maintenance and testing purposes.

Bartholomew further states, at column 10, lines 48-56:

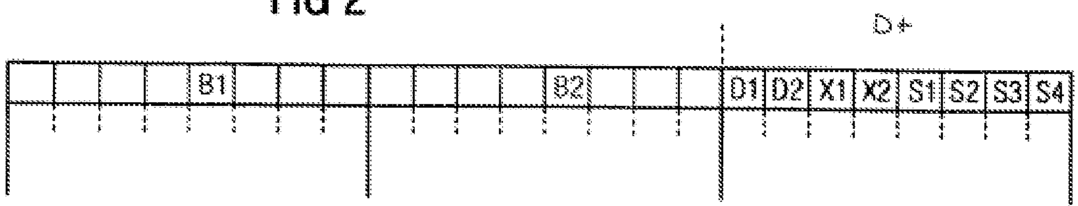
> Switched ISDN, such as provided to the customer at premises CP-2, typically utilizes three DSC time slots through the D4 channel bank 31 and the T1 link 33. **Two of these time slots transport the two bearer (B) channels. The other slot transports the embedded operations channel (EOC) and the data (D) channel for the one subscriber's ISDN service.** Some vendors are developing systems that combine D and EOC channels for two subscribers' lines, for transport over one DS0, to recapture unused capacity.

What Bartholomew describes here is the method that was described in the introduction of the specification as the state-of-the-art method. Page 4 of the Specification, lines 6-11, states:

> Figure 2 shows a division of an ISDN channel given plesiochronic transmission in an HDSL frame. This ISDN channel comprises a first and second user channel B1 and B2 as well as a signalling channel D+.

The channels B1, B2 and D+ have a respective width of one byte. The division of the channel D+ is as follows: bits D1 and D2 are for ISDN signalling, X1,X2, S1, S2, S3 and S4 are reserved for operational purposes (for example, activation, etc.).

FIG 2



This method of mapping the two ISDN B-channels, into two 64 kbits/s DS0s and mapping the two ISDN D-channels as well as the ISDN signalling (CL channel = 2 kbits/s eoc and 2 kbits/s other signalling) into a third DS0 is described in the ETSI HDSL standard TS 101 135 V.1.5.3 (2000-09). The following is the respective page from the HDSL standard that describes the ISDN transport in HDSL frames using a method, that corresponds to the method described in Bartholomew's patent.

7.7.3 Mapping procedures

7.7.3.1 Conversion of the ISDN-BA signals

The ISDN-BA signals at the application interface shall be converted into a structured digital 192 kbit/s signal with a frame length of three bytes, where the first two bytes shall contain the B-channels of the ISDN-BA. The third byte, which is shown in figure 49B as D+byte, shall contain the D-channel in the first and second bit position and bits S1 to S4 for interface activation/deactivation and loopback 2 activation/deactivation for 4B3T-based applications according to ETR 80 [6], annex B, in the fifth to eighth bit position. X1 and X2 in the third and fourth bit position can be used for the transport of special information in 4B3T applications or the CL-channel for 2B1Q-based applications according to ETR 80 [6], annex A, where X2 is used for the CL-channel and X1 for its multiframe indication.

ISDN-BA D+

				B1								B2				D1	D2	X1	X2	S1	S2	S3	S4
Byte 1								Byte 2								Byte 3							

Figure 49B: Structure of the 192 kbit/s of an ISDN-BA-frame

7.7.3.2 Mapping of the ISDN-BA to the core frame

As described in subclause 5.4 the application data shall be mapped bit sequence independently into a core frame with 144 bytes and 500 µs length. Only 128 bytes are occupied by the 2 048 kbit/s data signal. Into the remaining 16 bytes - indicated R and Y in figure 6b)- a 127 bit ISDN-sequence, containing the 12 bytes of 4 ISDN-BA-frames, a 7 bit Synch Word and 3 spare bytes Z, shall be transported. Figure 49C shows such an ISDN-sequence of 127 bit in one core frame. Dependent upon different tolerances of the ISDN-BA- and the data-clock this ISDN-sequence is floating inside the core frame, Figures 49D shows examples for possible positions.

The correct position of the ISDN-sequence is indicated by the synchronization word with a 7 bit long Barker Code 1110010, which has to be detected at the receiver.

To prevent simulation of the synchronization word the ISDN-sequence shall - with the exception of the synchronization word and the justification bits- be scrambled with the simple polynomial $1 + x^6 + x^7$.

Byte 0		1	1	1	0	0	1	0	Sync Word
Byte 1				B1					
Byte 2				B2	...				
Byte 3	D1	D2	X1	X2	S1	S2	S3	S4	
Byte 4				Z1	...				
Byte 5				B1					
Byte 6				B2	...				
Byte 7	D1	D2	X1	X2	S1	S2	S3	S4	
Byte 8				Z2					
Byte 9				B1					
Byte 10				B2					
Byte 11	D1	D2	X1	Z2	S1	S2	S3	S4	
Byte 12				Z3					
Byte 13				B1					
Byte 14				B2					
Byte 15	D1	D2	X1	X2	S1	S2	S3	S4	

Figure 49C: Structure of a ISDN-sequence with 127 bit

Bartholomew assigns the ISDN D-channels and the ISDN eoc bits to particular bits within the third DS0 channel. Bartholomew writes that the data streams of these channels are transmitted separately inside the DS0 (column 10

lines 51-54). Thus the eoc channel and the D channel are distinct channels.

However, the present invention is directed to a fundamentally different concept of the common control channel. There is only one signalling channel that combines the functionality of the ISDN control channel and of the control channel of the transport mechanism. There is only one bit stream of the common control channel.

Page 6, lines 7-10, of the specification states:

> The operational control information of the respective ISDN connection are transmitted in the overhead OH of the SDSL frame, where this control information is divided into a part relating to the SDSL transmission path and into a further part that is dependent on one or more transmitted services.

This is clearly specified in claims 5 and 6:

> Claim 5: A method according to claim 4, further comprising the step of depositing data for operational control of connections to which at least two terminal equipment types or services that is capable of including both voice and data are connected in a single operating eoc of said frame.
>
> Claim 6: A method according to claim 5, wherein said connections are telephony connections, ISDN connections or broadband connections.

This comparison of the present invention with Bartholomew's disclosure makes it evident that Bartholomew does not describe the concept of the common control channel, as claimed.

ARGUMENT 3–Anticipation of claims 9 and 10 by Bartholomew

Appellants' Position: Bartholomew does not teach or suggest that the operational control channel is outside of the payload data region, as required by claim 9.

Claims 9 and 10 of the present invention require that the operational control channel be outside the payload data region. The Examiner's assumption is incorrect that the EOC in Bartholomew is transmitted outside the payload data region in the overhead of the frame. To the contrary, Bartholomew discloses the

opposite: Bartholomew's EOC is transmitted together with the D-channel voice as payload data in a DS0. The DS0s carry the T1 payload data. They are not overhead and they do not belong to the frame.

On page 4, lines 15-19, the Examiner wrote:

> [.....] wherein EOC (embedded operations channel) is used for control (claimed control data) carried over a DS0, the DS carrying the EOC is different than the DS0s allocated for data), wherein the EOC is embedded in a DS0 of the T1 frame;

However, the DS0, that carries the EOC also carries the D-channel voice data, and the D-channels are definitely payload data. It is obvious that a DS0 cannot be part of the payload and of the overhead at the same time. Therefore, the Examiner's argument that the DS0 that carries the ISDN EOC can be regarded as overhead, is not correct.

The Examiner states, on page 5, lines 14–19 of the OA:

> Bartholomew further discloses concurrent ISDN voice and data being mapped into respective DS0 slots, see column 1, lines 39-49, and column 9, lines 3-20, wherein EOC (embedded operations channel) which is used for control (claimed common channel for operational control) is carried over a DS0 other than the DS0 for data, (T1 frame is a TDM frame as indicated by its nature of carrying multiplexed time slots);

All DS0s of the DS1 (for T1) carry payload data. The Examiner's distinction that one DS0 may be regarded as payload while the other is framing overhead is unfounded. The eoc transmitted in the DS0 is transmitted as payload data.

On page 7, lines 5-12, the Examiner states:

> Regarding claim 9, as discussed with reference to claim 4, Bartholomew disclose the frame being a T1 frame that comprises 24 DS0 slots, part of the DS0 comprises EOC bits for operational control, while two other DS0 comprises data only. (Examiner interpreted the two B channel comprising data only as the

> claimed payload data region, and part of the DS0 having the EOC as the claimed arranging bits for operational control). (Claimed providing bits for operational control in the data belonging to the terminal equipment types, and arranging the bits outside of the payload data region provided for the terminal types).

On page 7, lines 13-16, the patent examiner further states:

> Regarding claim 10, Bartholomew discloses having part of the DS0 comprises EOC bits for operational control for respective two B channels. (Examiner interpreted the part of the DS0 comprising EOC bits as the claimed bits for operational control are arranged in an overhead of the frame).

The present claims 9 and 10 specify that the transport of the operational control channel is outside the payload data region. Claim 9 reads:

> A method according to claim 4, further comprising the steps of: providing bits for operational control in said data belonging to a terminal equipment type; and arranging said bits outside of a payload data region provided for said terminal equipment.

Claim 10 reads:

> A method according to claim 9, wherein said bits for operational control are arranged in an overhead of said frame.

Bartholomew writes that the EOC and the D channels are transmitted in a DS0 within the T1 link. By definition, a T1 links consists of 24 x 64 kbits/s DS0 channels (plus 8 kbits/s for F bits). Therefore, the T1 data rate is 1544 kbits/s (=1536 kbits/s + 8 kbits/s). The DS1 rate is a payload data rate.

This means that the 64 kbits/s DS0s are payload data. The DS0s are not part of the frame. The DS0s are not overhead data. If an EOC is transmitted inside a DS0, it is transmitted as payload data.

Bartholomew's patent shows that the DS0 are T1 payload data. For example, Bartholomew writes in Column 8, lines 19-22:

> For example, if the D4 system has 24 channels to/from customer premises, it always transports all 24

> of those channels as DS0s on the assigned T1 link 33 between the channel banks 31, 35.

In Column 13, lines 14-15 Bartholomew writes:

> The T1 link 33 carries 24 of the DS0 channels between the D4 channel banks 31 and 35.

And in Column 9, lines 7-9, it is also shown that the EOC is transmitted as payload data and not as overhead data:

> The EOC and D channels are combined on another DS0 <u>within</u> the T1 link 33.

Thus Bartholomew describes a method that is fundamentally different from our method. Bartholomew transports the EOC as payload data. In our invention, the common channel for operational control is transmitted in the overhead of the frame. The patent examiner's assumption, that the DS0s are overhead or part of the frame is wrong. Moreover, it is wrong to assume that one DS0 belongs to the payload while the other DS0 is part of the framing overhead.

ARGUMENT 4–Anticipation of claim 11 by Bartholomew

Appellants' Position: Bartholomew fails to anticipate claim 11 of the present invention because it lacks a teaching of a sub-addressing method, as required by claim 11.

The control and messaging channels in Bartholomew's patent are realized as separate bit-streams . The present invention claims a fundamentally different concept, i.e., using only one signalling channel that can be shared by the different services. Each of these services transmits its messages over a logical channel that connects both sides.

In the OA, the Examiner states, on page 7, lines 17-22:

> Regarding claim 11, Bartholomew discloses part of the DS0 comprises EOC bits for operational control for respective two B channels, having the part of the DS0 for OEC bits for both two B channel is interpreted as the claimed addressing said bits for operational control via a sub-address in a message format of the operating channel, because some bits of the OEC are

> one for one B channel of the two B channel while the other bits of the EOC are related to the other B channel of the two B channel.)

Claim 11 of the present invention reads:

> A method according to claim 10, further comprising the steps of allocating said bits for operational control to an operating eoc channel; and addressing said bits for operational control via a sub-address in a message format of said operating channel.

In Bartholomew's patent, the EOC channel that is transported in a DS0 only serves one kind of service: It is an ISDN EOC channel which contains ISDN EOC messages. Since this EOC cannot be shared with other services, there are no sub addresses which assign the messages to their respective services. Bartholomew's patent does not describe anything that can be compared to the addressing mechanism from our invention. This addressing is only needed if different services share one EOC e.g. ISDN and SDSL.

Therefore, the Examiner is wrong in interpreting the disclosure of Bartholomew as teaching a sub-addressing method.

The application of this method is described in the present specification, on page 3, lines 8-10:

> 7) the plurality of possible, different services, for example, given a plurality of transmitted ISDN connections, are addressable on the basis of a suitable expansion of the eoc message format, for example, by inserting an eoc sub-address.

An example for the addressing of the individual control channels is described on page 6, lines 11-24 of the present specification and it is illustrated in Figure 7:

> Figure 7 shows an embodiment of the eoc address expansion necessary for the addressing of the individual ISDN connections or respectively, traditional telephone connections. To this end, the address of the eoc channel has an auxiliary address field attached to it. This auxiliary address field comprises the components service-ID and service No that are needed for an unambiguous addressing of the

respective connection.

For embedding this expansion into the previously existing message strategy for the eoc channel within an SDSL frame, a message encoding, for example, that was previously unused, is used in order to transmit existing signalling for operational purposes for exactly one type of service (for example ISDN). A specific service number within a service type (for example, one of a plurality of ISDN connections) is addressed in a following field that lies in the parameter region of this message encoding. In the same way, a further message encoding that is still free can be employed for traditional telephone connections.

FIG 7

Eoc -Message-encoding:	Message Byte 1	Message Byte 2
Service -ID (e.g. ISDN)	Service -No. (for example, selection of an ISDN connection)	Signalling for operational purposes

ARGUMENT 5–Obviousness of claims 12–14, 22, and 23 by Bartholomew in view of Chaplik

Examiner's Position: The Examiner has failed to establish a prima facie case of obvious and has simply combined two references and asserted the obviousness of the present invention.

The Examiner indicated in the OA, on p. 9, that the lack of teaching in Bartholomew related to the use of SDSL can be met by the teaching in Chaplik, paragraph [0005] that SDSL is mainly used as a replacement for T1 network connections.

Appellants generally rely upon the arguments above related to claims from which these claims depend and assert that the addition of the Chaplik reference does not resolve the shortcomings in the teaching of the required elements for

the independent claims.

However, additionally, Appellants note that the mere fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness. See MPEP §2143.01(III), citing to *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). In this case, the Examiner has combined a reference that identifies that SDSL has been used as a replacement for T1 network connections without providing any indication as to how one, in the context of either Bartholomew or the present invention, would implement the substitution of the SDSL and its attendant protocols to arrive at the present invention, and therefore, the combination of Bartholomew and Chaplik fails to teach or suggest claims 12–14, 22, and 23 of the present invention.

Furthermore, the Examiner has failed to indicate how the additional limitations in claims 12–14 and 23, beyond there mere substitution of SDSL in the place of T1, is met by the combination of references and therefore for this further reason has not met the *prima facie* burden of establishing a case of obviousness.

CONCLUSION

For the above reasons, Appellants respectfully submits that the Examiner is in error in law and in fact in rejecting the claims of the present application based on the teachings of the above-discussed references. Reversal of the rejection of all of those claims is justified, and the same is respectfully requested.

Respectfully submitted,

/Mark Bergner/ (Reg. No. 45,877)
Mark Bergner
SCHIFF HARDIN, LLP
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606-6473
(312) 258-5779
Attorneys for Appellant
Customer No. 26574

APPENDIX A
CLAIMS INVOLVED IN THE APPEAL

1. (previously presented) A circuit arrangement, comprising:

a transmission unit for inserting data belonging to at least two terminal equipment types or services that are capable of including both voice and data in a common frame having a frame length, said transmission unit comprising an insertion mechanism for inserting said data of the at least two terminal equipment types, said data of all terminal equipment types being synchronously inserted into said common frame with a common channel for operational control and transmitted with a digital time-division multiplex technique.

2. (previously presented) A circuit arrangement, comprising:

a reception unit for dividing a datastream transmitted in a frame, said frame comprising data belonging to at least two terminal equipment types or services that are capable of including both voice and data, by a transmitter to at least one terminal equipment type of said at least two terminal equipment types; and

a switch module for a purpose-conforming division of said datastream transmitted in said frame, in which a further division onto further terminal equipment of said at least two terminal equipment types or services is undertaken based on control data.

3. (original) A circuit arrangement, comprising a transmission-reception unit which comprises said transmission unit of claim 1, and said reception unit of claim 2.

4. (previously presented) A method for transmitting a data stream in a common frame with a common channel for operational control belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising the steps of:

synchronously inserting data of said at least two terminal equipment types or services into said common frame in a first unit;

transmitting said data to a second unit with a time-division multiplex method; and

dividing said data stream in said common frame to terminal devices of at least two terminal equipment types or services in said second unit.

5. (previously presented) A method according to claim 4, further comprising the step of depositing data for operational control of connections to which at least two terminal equipment types or services that is capable of including both voice and data are connected in a single operating eoc channel of said frame.

6. (original) A method according to claim 5, wherein said connections are telephony connections, ISDN connections or broadband connections.

7. (original) A method according to claim 4, further comprising the step of filling a payload data region available in a frame in a terminal equipment-specific manner depending on a transmission rate of a transmission link.

8. (original) A method according to claim 4, further comprising the step of connecting a plurality of terminal equipment of at least one terminal equipment type to a transmission-reception unit.

9. (previously presented) A method according to claim 4, further comprising the steps of:

providing bits for operational control in said data belonging to said terminal equipment types or services; and

arranging said bits outside of a payload data region provided for said terminal types or services.

10. (original) A method according to claim 9, wherein said bits for operational control are arranged in an overhead of said frame.

11. (original) A method according to claim 10, further comprising the steps of:

allocating said bits for operational control to an operating eoc channel; and

addressing said bits for operational control via a sub-address in a message format of said operating channel.

12. (original) A method according to claim 4, further comprising the step of accepting data of a plurality of ISDN connections in said frame, said frame being a symmetric digital subscriber line frame.

13. (original) A method according to claim 4, further comprising the step of accepting data of a plurality of traditional telephony connections in said frame, said frame being a symmetric digital subscriber line frame.

14. (previously presented) A method according to claim 4, wherein said step of transmitting said data comprises transmitting said data of a symmetric digital subscriber line frame synchronously on a transmission link between said

first unit, which is a network node, and said second unit, which is a network termination unit with a time-division multiplex method.

15. (canceled).

16. (previously presented) A method for transmitting a data stream in a common frame with a common channel for operational control belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising the steps of:

synchronously inserting data of said at least two terminal equipment types or services into said common frame in a first unit;

synchronously transmitting said data to a second unit with a time-division multiplex method; and

dividing said data stream of said common frame to terminal devices of at least two terminal equipment types or services in said second unit.

17-21. (canceled).

22. (previously presented) The circuit arrangement according to claim 1, wherein the common frame is an SDSL frame.

23. (previously presented) The circuit arrangement according to claim 22, wherein the data belonging to at least two terminal equipment types or services are provided within an ISDN service that are transmitted inside of the SDSL frame.

APPENDIX B
EVIDENCE APPENDIX

There is no additional evidence entered and relied upon for this appeal.

APPENDIX C
RELATED PROCEEDINGS APPENDIX

There are no related proceedings associated with this appeal